

Micropower Impulse Radar

"Genie on a chip" technology opens many new doors for U.S. industry



LNL's micropower-impulse radar (MIR) presents a new paradigm in radar technology. MIR uses \$10 of off-the-shelf components to outperform conventional radar and sensor equipment costing as much as \$40,000. Both the radar transmitter and receiver are contained in a package measuring just two square inches; eventually the microradar is expected to be shrunk to the size of a silicon microchip.

APPLICATIONS

Partial listing includes:

- Residential, commercial, and industrial automation
- Security and energy conservation
- Fluid level sensing
- Transportation
- Medical
- Radar imaging
- Material evaluation
- Tools
- Voice recognition equipment
- Communication
- Underground detection
- Military, including buried mine and ordinance detection

Outgrowth of laser technology

The technology is an outgrowth of the world's fastest solid-state digitizer, which was designed to measure sub-nanosecond events generated by fusion experiments on the Laboratory's Nova laser. MIR is based on the radiation of short voltage impulses that are reflected off nearby objects and detected by MIR's extremely high-speed sampling receiver. Prototype units emit one million impulses per second and then detect their echoes within ranges of 20 feet, or further with the addition of synthetic beam forming antennas. The microradar can be preset to detect stationary objects within a precisely defined range as well as any motion within that area. MIR

can penetrate materials such as rubber, plastic, wood, concrete, glass, ice, and mud.

The technology already has been licensed for electronic studfinders, automotive safety products, and industrial automation. Discussions with hundreds of interested companies indicate there are many products



An MIR motion sensor converts an ordinary tail light lens into a back-up warning radar for parking assistance.

that will be improved and reduced in price by MIR. The application box provides a partial listing of the many other fields-of-use that are available for licensing.

Availability: We are not an equipment manufacturer; therefore our goals are to 1) License MIR to qualified companies who can develop products; 2) Continue to develop variations of the MIR for our Laboratory mission; and 3) Seek out new ideas for future directions of this exciting technology.

Contacts

Tom McEwan (technical)
Phone: (510) 422-1621
Fax: (510) 422-3358
E-mail: mcewan@llnl.gov
Mail code: L-495

Bill Grant (licensing)
Phone: (510) 423-3082
Fax: (510) 423-8988
E-mail: grant9@llnl.gov
Mail code: L-795